

CLAIMS

Having thus described our invention, what we claim as new and desire to secure by Letters Patent is as follows:

- 1 1. A computer implemented method of visual representation of programming
 2 objects as graphical elements, wherein programming properties of
 3 programming objects are reflected through graphical properties of graphical
 4 elements, the method comprising the steps of:
 5 detecting a change in a state of a data element representing a
 6 programming object in visual representation and shown visually on a display
 7 device, wherein the data element represents a programming object as graphical
 8 elements and programming properties of programming objects are reflected
 9 through graphical element properties;
 10 determining graphical aspect changes that apply to graphical elements
 11 of the programming object appropriate for the change in state; and
 12 applying the graphical aspect changes to corresponding graphical
 13 elements, wherein the graphical aspect changes include changes in color,
 14 position and size.
- 1 2. A computer implemented method as recited in claim 1, wherein
 2 determining graphical aspect changes further comprises the steps of:
 3 traversing a list of graphical aspect references to acquire a graphic
 4 aspect for the data element, wherein there is a many-to-one relationship
 5 between graphical aspect references to graphic aspects and a graphic aspect;
 6 and
 7 for each graphic aspect referenced by the list of graphical aspect
 8 references, determining whether the graphic aspect applies to the change in

9 state.

1 3. A computer implemented method as recited in claim 1, wherein the visual
2 representation of a first programming object may include other visual
3 representations corresponding to at least one additional programming object
4 logically contained within the first programming object.

1 4. A computer implemented method as recited in claim 1, wherein more than
2 one visual representation is defined for a programming object.

1 5. A computer implemented method as recited in claim 4, wherein any of the
2 more than one visual representation may be used for the programming object.

1 6. A computer implemented method as recited in claim 1, wherein the visual
2 representation for a superclass of a programming object is used as the visual
3 representation for a subclass programming object.

1 7. A computer implemented method as recited in claim 6, wherein a visual
2 representation of a superclass of the programming object is used as a visual
3 representation for a subclass of the programming object.

1 8. An apparatus for visual representation of programming objects as graphical
2 elements comprising:

3 a data processing system comprising a display device, an interactive
4 device, as in a keyboard, a pointing device, a storage device, and a data
5 processor;

6 memory coupled to the data processor via a bidirectional bus, wherein
7 the memory includes a first memory section for at least one program and a

8 second memory section for data;
9 computer code comprising a visual programming language, wherein
10 the computer code is stored in the first memory section, and the computer
11 code detects changes in state information corresponding to a data element and
12 applies graphic aspects to a visual representation of the data element which
13 represents the state change; and
14 means for displaying the visual representation of a plurality of data
15 elements on the display device.

1 9. A machine readable medium containing code for visual representation of
2 programming objects as graphical elements, wherein programming properties
3 of programming objects are reflected through graphical properties of graphical
4 elements, the code implementing the steps of:
5 detecting a change in a state of a data element representing a
6 programming object in visual representation and shown visually on a display
7 device, wherein the data element represents a programming object as graphical
8 elements and programming properties of programming objects are reflected
9 through graphical element properties;
10 determining graphical aspect changes that apply to graphical elements
11 of the programming object appropriate for the change in state; and
12 applying the graphical aspect changes to corresponding graphical
13 elements, wherein the graphical aspect changes include changes in color,
14 position and size.